AMENDMENTS TO THE CLAIMS

Please amend the present application as follows:

Claims

1-20.   (Canceled)

21.   (New) A sensor circuit comprising:

a photodiode for detecting light incident upon the photodiode;

a power supply configured to provide a differential supply voltage; and

an amplifier circuit coupled to the photodiode, the amplifier circuit comprising:

an operational amplifier powered by the differential supply voltage;

a serial chain of resistors; and

a first set of switches operable to couple a feedback circuit to the operational amplifier by configuring the serial chain of resistors in one of

a) a first resistor feedback combination having a resistance value R_n that is determined based on the differential supply voltage and a desired detectable level of light, or

b) a second resistor feedback combination having a resistance value R_{n+1} that is equal to αR_n wherein α is a desired accuracy parameter of the color sensor, and wherein the resistance value R_{n+1} is lower than the resistance value R_n.

22.   (New) The sensor circuit of claim 21, wherein the desired accuracy parameter α is defined as a percentage value of the differential supply voltage corresponding to a maximum guaranteed output voltage swing from the amplifier circuit in response to a desired maximum level of light incident upon the photodiode.

23.   (New) The sensor circuit of claim 22, wherein the percentage value is less than 100% of the differential supply voltage whereby the desired accuracy parameter α has a value less than 1.

24.   (New) The sensor circuit of claim 21, wherein the second resistor feedback combination is generated by omitting a resistor from the first resistor feedback combination, the omitting being carried out by operating at least one switch in the first set of switches.

25.   (New) The sensor circuit of claim 24, wherein a detectable level of light M_{n+1} is higher upon coupling the second resistor feedback combination into the operational amplifier in comparison to coupling the first resistor feedback combination into the operational amplifier.

26.   (New) The sensor circuit of claim 25, wherein the detectable level of light M_{n+1} is defined by the relationship $M_{n+1} = R_n/\alpha$.

27.   (New) The sensor circuit of claim 21, wherein the amplifier circuit further comprises:
        a first capacitor that is included in the feedback circuit for providing a first frequency compensation to the amplifier circuit;
        a second capacitor having a capacitance value that is selected for providing in conjunction with the first capacitor, a second frequency compensation to the amplifier circuit;
        a third capacitor having a capacitance value that is selected for providing in conjunction with the first capacitor, a third frequency compensation to the amplifier circuit and for providing in conjunction with the first and second capacitors, a fourth frequency compensation to the amplifier circuit; and
        a second set of switches operable to couple at least one of the second or third capacitors in parallel with the first capacitor in the feedback circuit.

28.   (New) The sensor circuit of claim 27, wherein at least one of the first set or the second set of switches is controlled by a combination of digital control bits.

29.   (New) The sensor circuit of claim 21, wherein the differential supply voltage comprises Ground and Vcc.

30.   (New) A method of operating the sensor circuit of claim 21, the method comprising:
        providing a graph of detectable levels of light versus output voltage swing from the amplifier circuit for various resistance values;
        using the desired detectable level of light and a desired output voltage swing, for identifying a resistance value from the graph; and

operating the first set of switches for configuring the serial chain of resistors to
provide a resistor feedback combination having the resistance value identified from the
graph.

31.   (New) The method of claim 30, further comprising:

defining a range of detectable levels of light;

selecting a desired resistance value from the graph; and

using the desired resistance value and the defined range of detectable levels of
light to identify from the graph, a range of output voltage swing.

32.   (New) A sensor circuit comprising:

a photodiode for detecting light incident upon the photodiode;

a power supply configured to provide a differential supply voltage; and

an amplifier circuit coupled to the photodiode, the amplifier circuit comprising:

an operational amplifier powered by the differential supply voltage;

a first series resistor combination having a resistance value R_n; and

a second series resistor combination having a resistance value R_{n+1} that is
lower than the resistance value R_n;

a first set of switches operable to generate the second series resistor
combination by decoupling at least one resistor from the first series resistor
combination, and further operable to couple the second series resistor
combination to the operational amplifier as part of a feedback circuit;

a first capacitor that is included in the feedback circuit for providing a first
frequency compensation to the amplifier circuit;

a second capacitor having a capacitance value that is selected for
providing in conjunction with the first capacitor, a second frequency
compensation to the amplifier circuit;

a third capacitor having a capacitance value that is selected for providing
in conjunction with the first capacitor, a third frequency compensation to the
amplifier circuit and for providing in conjunction with the first and second
capacitors, a fourth frequency compensation to the amplifier circuit; and

a second set of switches operable to couple at least one of the second or
third capacitors in parallel with the first capacitor in the feedback circuit.

33.   (New) The sensor circuit of claim 32, wherein a level of light M_{n+1} detected by the sensor circuit is higher upon coupling the second resistor combination into the operational amplifier in comparison to coupling the first resistor combination into the operational amplifier.

34.   (New) The sensor circuit of claim 33, wherein the detectable level of light M_{n+1} is defined by the relationship $M_{n+1} = R_n/\alpha$, wherein α is an accuracy parameter defined as a percentage value of the differential supply voltage corresponding to a maximum guaranteed output voltage swing from the amplifier circuit in response to a desired maximum level of light incident upon the photodiode.

35.   (New) The sensor circuit of claim 34, wherein the percentage value is less than 100% of the differential supply voltage whereby the desired accuracy parameter α has a value less than 1.

36.   (New) The sensor circuit of claim 32, wherein a combination of digital control bits is used for controlling the first set and the second set of switches, thereby providing a selectable plurality of combinations of resistors and capacitors in the feedback circuit.